EASTMARK

(formerly Mesa Proving Grounds)

MASTER TRANSPORTATION PLAN UPDATE – March 2016

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DMB® Master Developer Approval EASTMARK

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1.0 INTRODUCTION

1.1 General Background

DMB Mesa Proving Grounds, LLC (DMB) is the owner/developer of Eastmark (Site) located at the southeast corner of Elliot and Ellsworth Roads, which was formerly referred to as Mesa Proving Grounds. On November 8, 2008, the City of Mesa (City) approved among other items, a rezoning of the Site to Planned Community. As part of that request, a Community Plan was also approved that identified the vision for the development of the Site with development standards and permitting processes. As part of the approval of the Community Plan, the City also accepted the Mesa Proving Grounds Master Transportation Plan, dated September 23, 2008.

The original Master Transportation Plan in September of 2008 was comprised of nine (9) Development Units (DU) as defined in the Community Plan. In this update, there are a total of eleven (11) Development Units within the site. Development Unit Plans (DUP) are prepared and submitted to the City for review and approval prior to any development occurring within a DU. Section 5.1 of the Community Plan defines DUP Submittal Requirements. The DU Transportation Plan depicts general locations of major streets and secondary streets, proposed major intersections and secondary intersections in conformance with the Master Transportation Plan and any necessary updates. As warranted, an update or addendum to the Master Plan will be submitted when requested by the City Traffic Engineer.

The City has requested an update to the Master Transportation Plan, and this is the second update that has been developed. The first update was finalized in August 2014. In this update, the development thresholds and transportation networks for DU's 3, 4, 5e, 6s, 6n, 7, 8, and 9 will be included. Assumptions for DU's 1, 2, 5 and 6 remained the same as the original Master Transportation Plan, with the exceptions of the "Apple" site (DU 6n) at the southwest corner of Elliot Road and Signal Butte Road, a manufacturing site (DU 5e) at the northeast corner of the original DU 5, and DU 6 which occupies approximately half of the original DU 6s area on the corner of Eastmark Parkway and Point 22 Boulevard.

The Site location and revised DU's are shown in **Figure 1.1**.

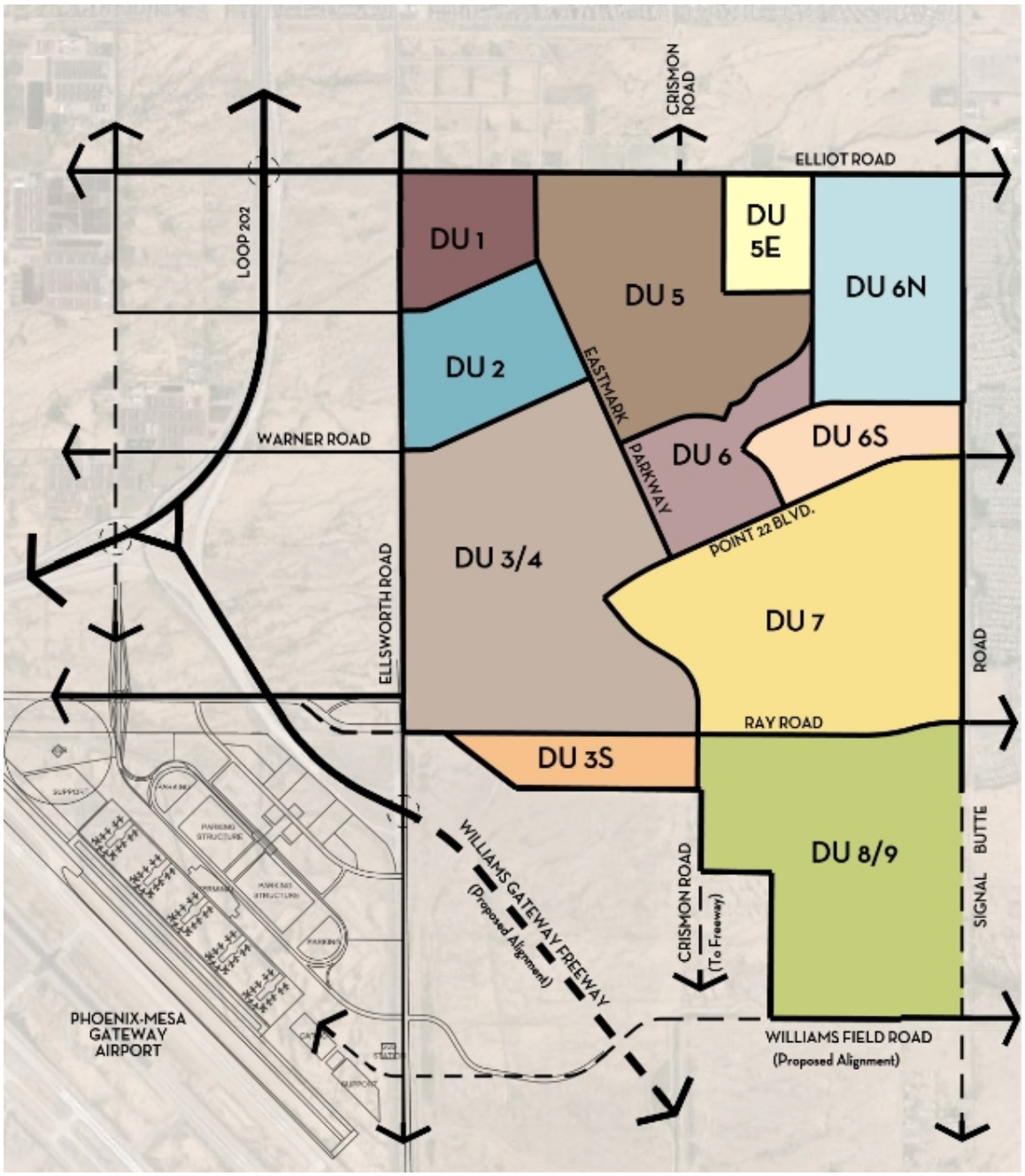

Figure 1.1 Location Map and Development Units

2.0 PROPOSED PROJECT

2.1 Preliminary Planning Concept

A preliminary framework with a proposed land use budget was developed for Eastmark as part of the Community Plan based on the nine (9) Development Units (DU). The intent was to provide a range of minimum and maximum development volumes for each DU that will be balanced amongst the DU's as development, and ultimately, redevelopment occurs. Total build-out for Eastmark will not exceed 15,000 dwelling units and 20 million square feet of commercial development. The approved land use budget for the Site is presented in **Table 2.1**.

Table 2.1 Eastmark Approved Land Use Budget

DEVELOPMENT UNIT	DWELLING UNITS MINIMUM-MAXIMUM BUDGET		GFA OF NON-RESIDENTIAL MINIMUM-MAXIMUM BUDGET		ACRES	LAND USE GROUPS
DU #1	200	2,000	4,375,000	7,000,000	130	OS,CS,GU,UC
DU #2	390	2,800	50,000	5,500,000	190	OS,CS,D,GU,UC
DU #3	1,120	3,600	50,000	1,000,000	540	OS,CS,V,D,C,GU,UC
DU #4	200	1,350	2,250,000	6,500,000	160	OS,CS,C,GU,UC
DU #5	710	1,680	1,875,000	8,750,000	500	OS,CS,C,E,V,D,R,GU,UC
DU #6	890	3,310	0	6,500,000	528	OS,CS,E,V,D,C,R,GU
DU #7	1,270	4,060	0	375,000	590	OS,CS,E,V,D,GU
DU #8	890	2,810	0	350,000	360	OS,CS,E,V,D,GU
DU #9	430	1,250	0	500,000	200	OS,CS,E,V,D,C,GU,UC

2.2 Current Planning Concept

Several of the DU's have been approved by the City, including DU 3s, DU 3/4, DU 5e, DU 6n, DU 7, and DU 8/9. DU 6s is in the process of approval with support from this Master Transportation Plan update. The majority of the completed DU's have been developed below the assumed mid-point thresholds of the land use budget. This Master Transportation Plan Update includes the results of the traffic studies that have been prepared for each of these DU's. A summary of the approximate development levels for each are presented in **Table 2.2**.

Table 2.2 Eastmark Approved DU Land Uses

DEVELOPMENT UNIT	DWELLING UNITS	GFA OF NON-RESIDENTIAL	LAND USE GROUPS
	APPROX ACTUAL	APPROX ACTUAL	
DU #3s	392	0	V,OS,CS
DU #3/4	5,711	3,406,000	V, D, C, OS,CS,GU,UC
DU #5e	0	404,000	C,CS,OS,R
DU #6n	0	1,330,000	C,GU
DU #6s	244*	265,716	E,V,D,OS,CS
DU #7	1,738	81,000	E,V,GU,OS
DU #8/9	1,447	32,000	OS,E,V,GU

* 244 residential lots are in the process of being approved.

2.3 Master Street Circulation Plan

Figure 2.2 shows the Master Street Circulation Plan for Eastmark. The current master street network is similar to the initial proposed network with a few exceptions:

- "Spine East" (now Eastmark Parkway) connects to Signal Butte Road rather than Williams Field Road. This was approved as part of DU 8/9.
- "Solar Way" has been modified from the August 2014 update to provide a connection between Elliot Road and a to be named District Street.
- A new east-west district street referred to as "District Street" is anticipated in DU 6N and DU 5, providing a connection between Signal Butte Road and Eastmark Parkway.
- "Crismon Connection" is no longer anticipated to exist in DU 5.

- A new north-south district street referred to as “Copernicus Drive” is anticipated in DU 3/4, providing a connection between Ray Road and Point Twenty-Two Boulevard.
- A new north-south district street referred to as “Parc Joule” is anticipated in DU 6s, providing a connection between Point Twenty-Two Boulevard and a to be named District Street.
- A north-south district street referred to as “Everton Terrace” is anticipated in DU 6 and DU 7, providing a connection between District Street and Ray Road.
- “Gaylord Drive” in DU 2 will now be referred to as a to be named District Street.

In accordance with the initial Master Transportation Plan, the roadway network is designed to encourage multi-modal transportation, including, but not limited to, transit, bicycles, pedestrians, multiple electric vehicle options (MEVOs), including neighborhood electric vehicles (NEVs), electric scooters, and other plug-in electrically powered vehicles.

The transportation network follows the policies and guidelines set forth in the *Mesa 2025 Transportation Plan*, adopted by the City Council on June 24, 2002. In addition to the General Plan, the City of Mesa has developed several sub-area and neighborhood plans to refine the development policy direction for specific areas of the community. The *Mesa Gateway Strategic Development Plan*, adopted December 8, 2008, includes Eastmark and has the following strategies:

- Encourage businesses to provide or subsidize transit passes.
- Encourage projects to include covered shelters within project boundaries; include kiosks with information regarding local transit.
- Design all streets to take into consideration the needs of pedestrians and bicyclists, as well as motor vehicles. The plan’s roadway network is supportive of “complete streets” characteristics that provide half of the physical space to the pedestrian realm.
- Include bike and pedestrian paths and/or connectors to existing paths for accessibility.

2.4 Master Transit Plan

Per the initial Master Transportation Plan, a regional transit system is anticipated to be implemented that will be incorporated into Eastmark. The *Mesa 2025 Transportation Plan* presents future transit improvements for this area. This includes local bus service on Elliot Road and Ray Road, west of Ellsworth Road, and on Warner Road, west of Signal Butte Road. North-south local bus service is anticipated on Ellsworth Road and Signal Butte Road. Future regional express bus service is anticipated on SR 202L. These transit corridors will provide direct service to Eastmark and provide connectivity, both internally and externally. Once known, the corridors are proposed to be coordinated into the land use planning for the Site.

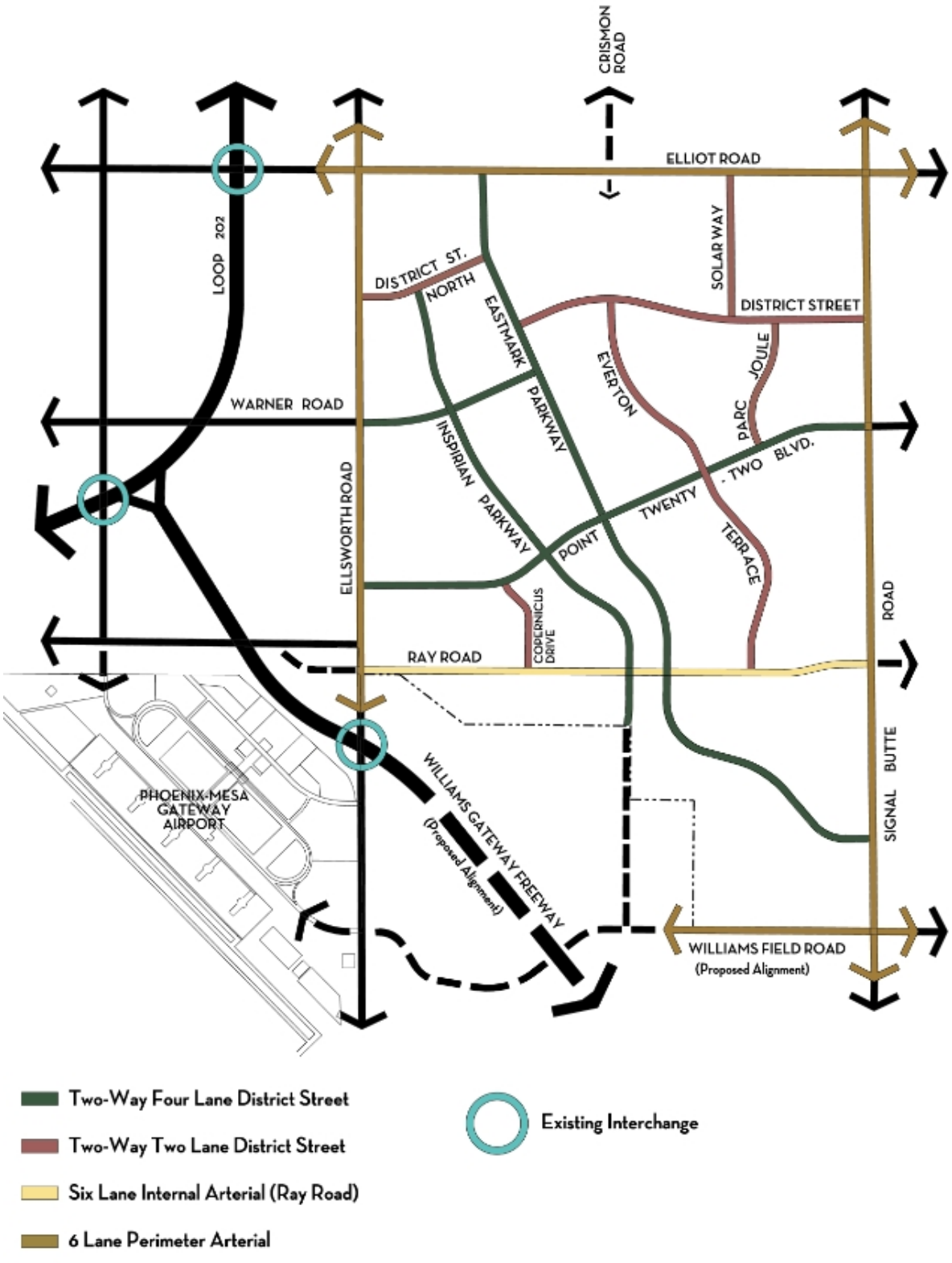

Figure 2.2 Conceptual Master Street Circulation Plan

2.5 Master Bicycle and Urban Trail Circulation Plan

The goal of the community is to encourage alternate travel modes through narrow streets and connected roadway networks. Therefore, the transportation network within Eastmark accommodates and provides continuity to bicycle, pedestrian, transit and other vehicular networks beyond the site boundaries. The local streets and district streets may have separate bike lanes, but the roadway cross sections will be designed to encourage bicycles and vehicles to share the roadway. Bike lanes will be present on all arterial roadways. A multi-use path will be incorporated into Eastmark Great Park and will run the full length of the park. In addition, there will be a multi-use path along the north side of Point Twenty-two Boulevard between Ellsworth Road and Eastmark Great Park.

3.0 FUTURE ROADWAY NETWORK

3.1 Future Background Traffic Conditions

Future background traffic estimated to be on the major roadways adjacent to the development was obtained from MAG for year 2030 for use in the initial Master Transportation Plan. This was the 20-year design horizon established and maintained by MAG at the time of the original study. MAG uses a capacity constrained traffic model, which contains socioeconomic data in each Traffic Analysis Zone (TAZ), to estimate the volume of traffic on the future regional roadway network. In order to estimate the background traffic adjacent to the development, a unique MAG model run was conducted in September 2007 that excluded any socioeconomic data within the Eastmark boundary.

The current MAG design year horizon and future traffic model is year 2040. Therefore, similar to the August 2014 update, this update considers year 2040 as the ultimate build-out year for the Site. It is important to note that MAG continuously reviews traffic data, travel patterns, and changes in travel modes to update their future traffic projections. Advanced modeling technologies have recently been implemented, resulting in noticeable differences between the 2030 and 2040 background traffic projections from MAG. Many roadway segments are now predicted to carry less background traffic in the 2040 model than what was projected by the 2030 MAG model. In this update to the Master Transportation Plan, Everton Terrace, Parc Joule, District Street, Copernicus Drive, and a modified Solar Way have been shown in the Figure with no volume to reflect the updated road networks and land uses within the site.

The projected year 2040 traffic volumes as provided by MAG to the City of Mesa are presented in **Figure 3.1**. The current 2040 MAG model includes socio-economic data and development within the Eastmark Site. However, the socio-economic data was not provided to the City of Mesa or the Eastmark planning team.

In an effort to establish background traffic on the adjacent roadway network without Eastmark site-generated traffic volumes, a calculation was completed to estimate the socio-economic data that MAG likely assumed for the Site based on the initial *Master Transportation Plan*. Based on the lower background volumes, the level of development on this Site was determined to be relatively low within the MAG model. The assumed background traffic volumes excluding any development on the Eastmark Site are presented in **Figure 3.2**.

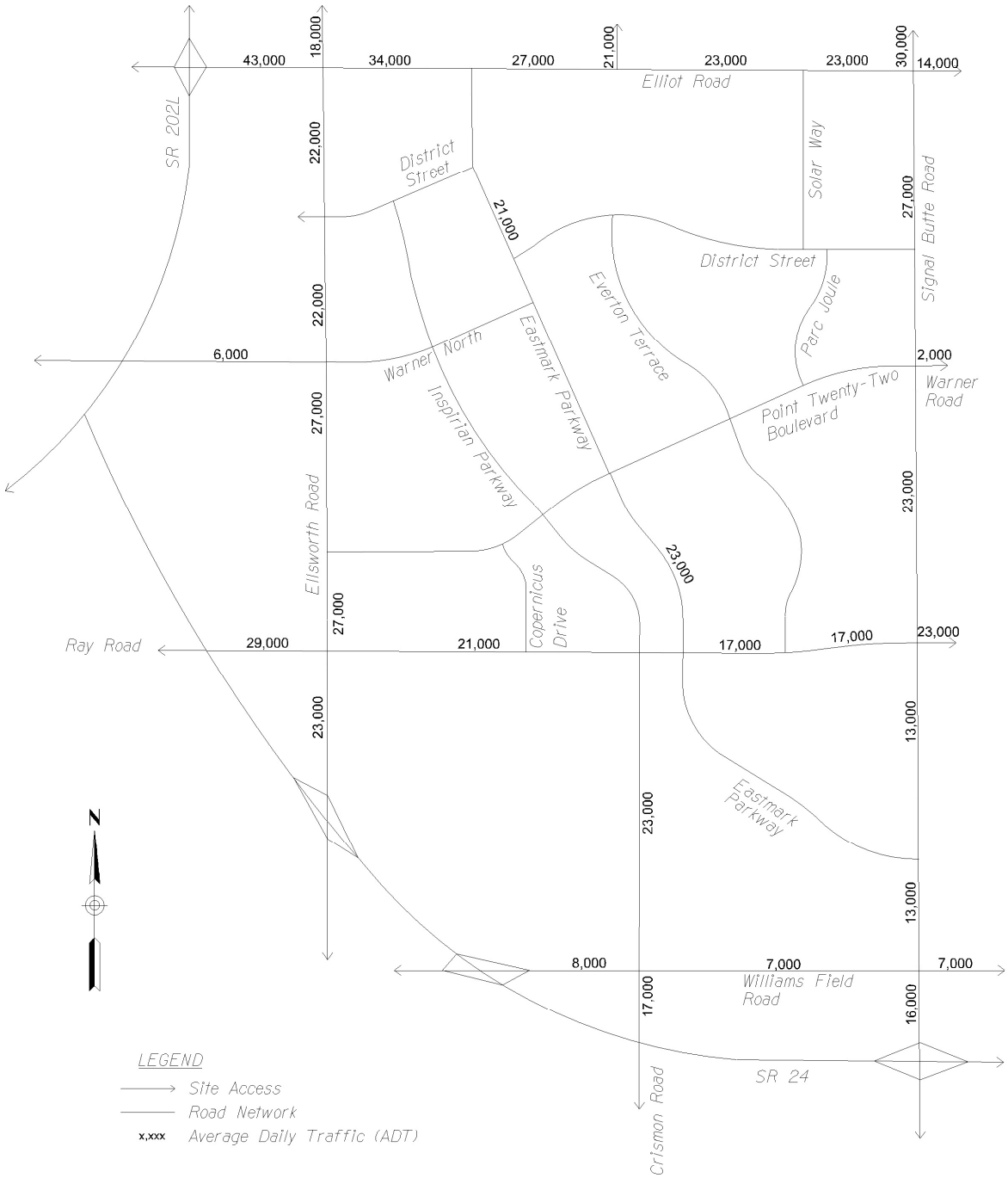

Figure 3.1 MAG Year 2040 Background Traffic Volumes

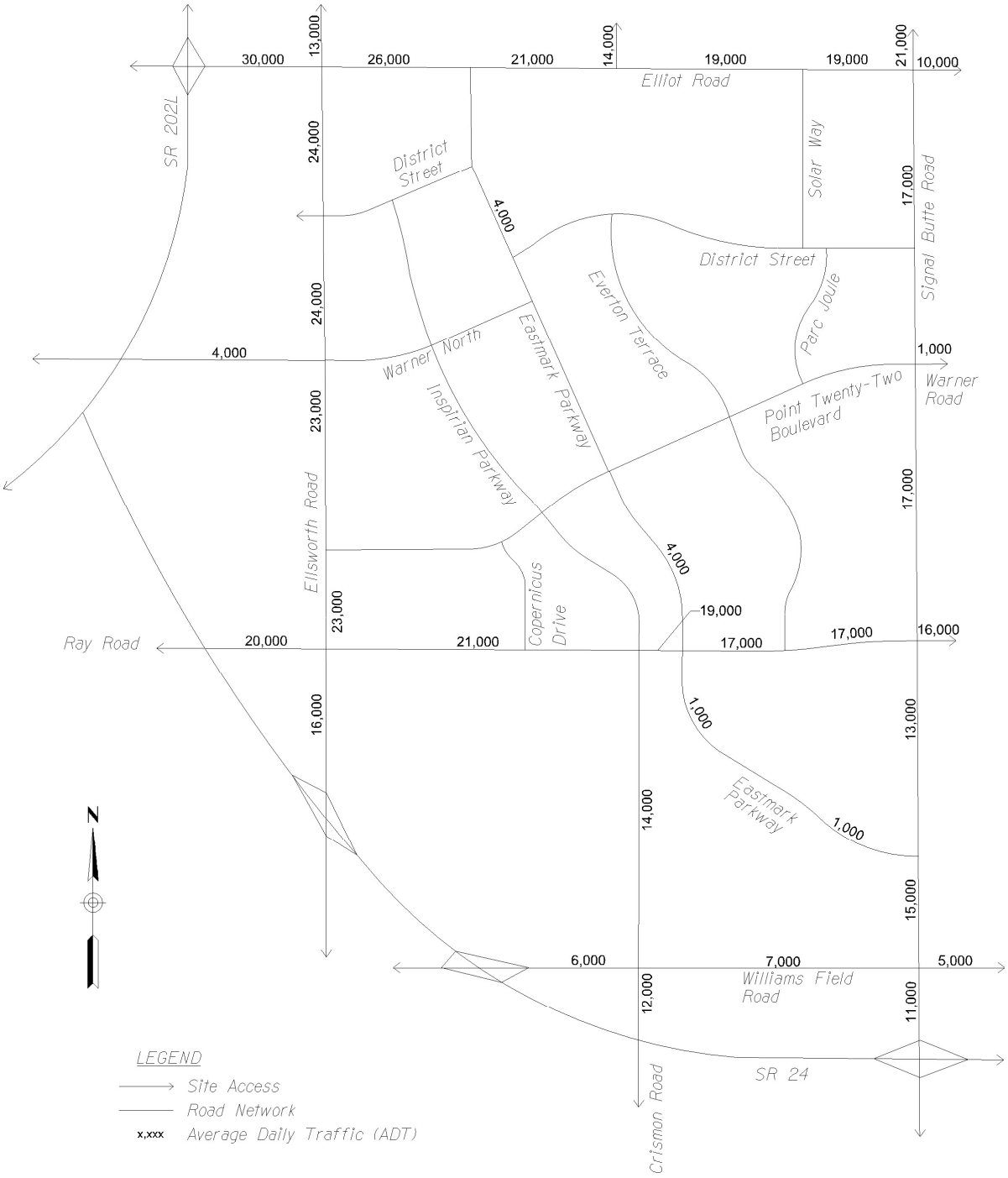

Figure 3.2 Year 2040 Background Traffic Volumes Excluding Eastmark

4.0 PROJECTED SITE TRAFFIC

4.1 Site Trip Generation

The daily weekday traffic volumes that may be generated by Eastmark were estimated based on the land use budgets from **Table 2.1**. The average trip generation rates published in *Trip Generation, Seventh Edition* by the Institute of Transportation Engineers (ITE) were used for this analysis.

Table 4.1 shows an approximate volume of site traffic generated by the updated planning concept as of March 2016. It is estimated that the development may generate approximately 294,300 trips per day on an average weekday. Similar to the original *Master Transportation Plan*, a pass-by trip factor of 35% was used for the retail land uses in the development. The percentage of pass-by trips for office, hotel, school, and residential land uses are assumed to be negligible. This pass-by trip reduction was applied to the site traffic only and not background traffic; only traffic attracted to, and generated by, the on-site retail land uses were reduced. Background traffic volumes were not reduced but have diversion trips on-site.

Table 4.1 Eastmark Trip Generation, March 2016

Land Use	Land Use Code (LUC)	LUC Units	Intensity	Trip Gen Rate, Avg Weekday	Internal Trip Capture	Pass-by %	Resultant Total ADT
Residential							
High Density	222	DU	9,800	4.20	Varies	0%	33,300
Medium Density	230	DU	2,200	5.86	Varies	0%	11,600
Low Density	210	DU	3,400	7.38	Varies	0%	21,900
Office	710	1,000 SF	12,600	11.85	Varies	0%	139,200
Retail	82	1,000 SF	1,300	38.7	Varies	35%	30,200
Hotel	330	Occ. Rooms	2,900	8.7	Varies	0%	23,400
Golf/ Civic Space	430	Acres	300	5.04	Varies	0%	1,600
Elementary/Middle School	520 & 522	Students	2,100	1.46	Varies	0%	2,500
Grand Canyon University	550	Students	15,000	2.38	Varies	0%	28,800
Manufacturing	140	Employees	900	2.13	Varies	0%	1,800
Total							294,300

The same adjustments for multi-modal traffic volumes were utilized for this update. No reduction was made for bike and pedestrian trips. Internal capture rates vary based on land uses within each DU. Approximately 2.5% of the total trips generated by the development are assumed to use transit. Resultant total average daily traffic (ADT) volumes shown in the table do not match the numbers presented in previous DU transportation studies due to differing internal capture rates between the DU study and the overall master plan study.

4.2 Site Trip Distribution

The site trip distribution for Eastmark was initially developed by reviewing regional roadway networks and assumptions of the interaction between the proposed future developments in the surrounding area, in particular Superstition Vistas, Phoenix-Mesa Gateway Airport, and ASU Polytechnic Campus. Residential, office and commercial traffic is estimated to be distributed in each of the four cardinal directions. The assumptions used for the original *Master Transportation Plan* are still reasonable. Therefore, trip distributions assume 15% of the development trips remain internal and are distributed on the roadway network within the development, and the remaining 85% is assumed to leave the development and be distributed to the external roadway network as shown in **Table 4.2**.

Table 4.2 Trip Distribution

Distribution Percentage				
Internal	External to Eastmark			
	North	South	East	West
15%	15%	25%	20%	25%

The travel demand forecasting model QRS II was used to estimate total traffic generated by the Site and distribute to the internal and external streets. QRS II is a gravity based transportation model that uses socioeconomic data (population and employment) to generate and distribute trips created by the land uses within the Site. The QRS II model created for Eastmark includes the local roadways as well as the major roadways in order to better assess site traffic distribution. In the August 2014 update to the Transportation Master Plan, the roadway network and transportation analysis zones (TAZ) were modified from the initial model runs to account for the known roadway networks and land uses in DU's 3, 4, 5e, 6n, 7, 8, and 9. In this update, the roadway network was further modified to account for the known roadway networks and land uses in DU's 5, 6, 6n, and 6s. The resultant total site generated traffic in the model is presented in **Figure 4.1**.

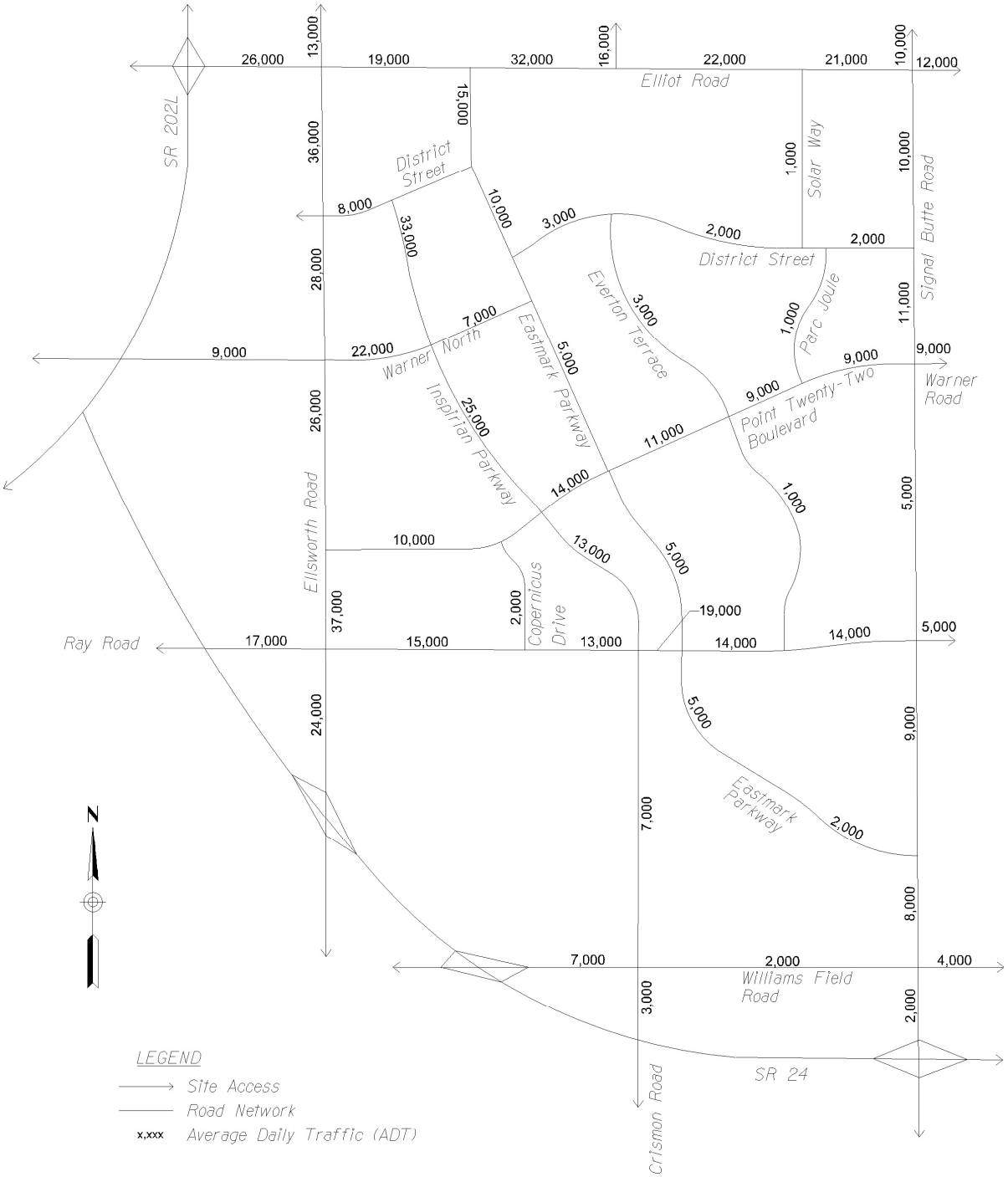

Figure 4.1 Site Traffic for Eastmark (Build-Out)

4.3 Year 2040 Total Traffic

For the purposes of this update, the total build-out site traffic is assumed to reflect the known land uses on developed DU's and anticipated land uses per the Community Plan for the undeveloped DU's. The site build-out traffic was added to the MAG 2040 background traffic (excluding Eastmark) to obtain an estimate of the total traffic volumes on the internal and external roadway networks. **Figure 4.2** presents the resultant total traffic for Eastmark in year 2040.

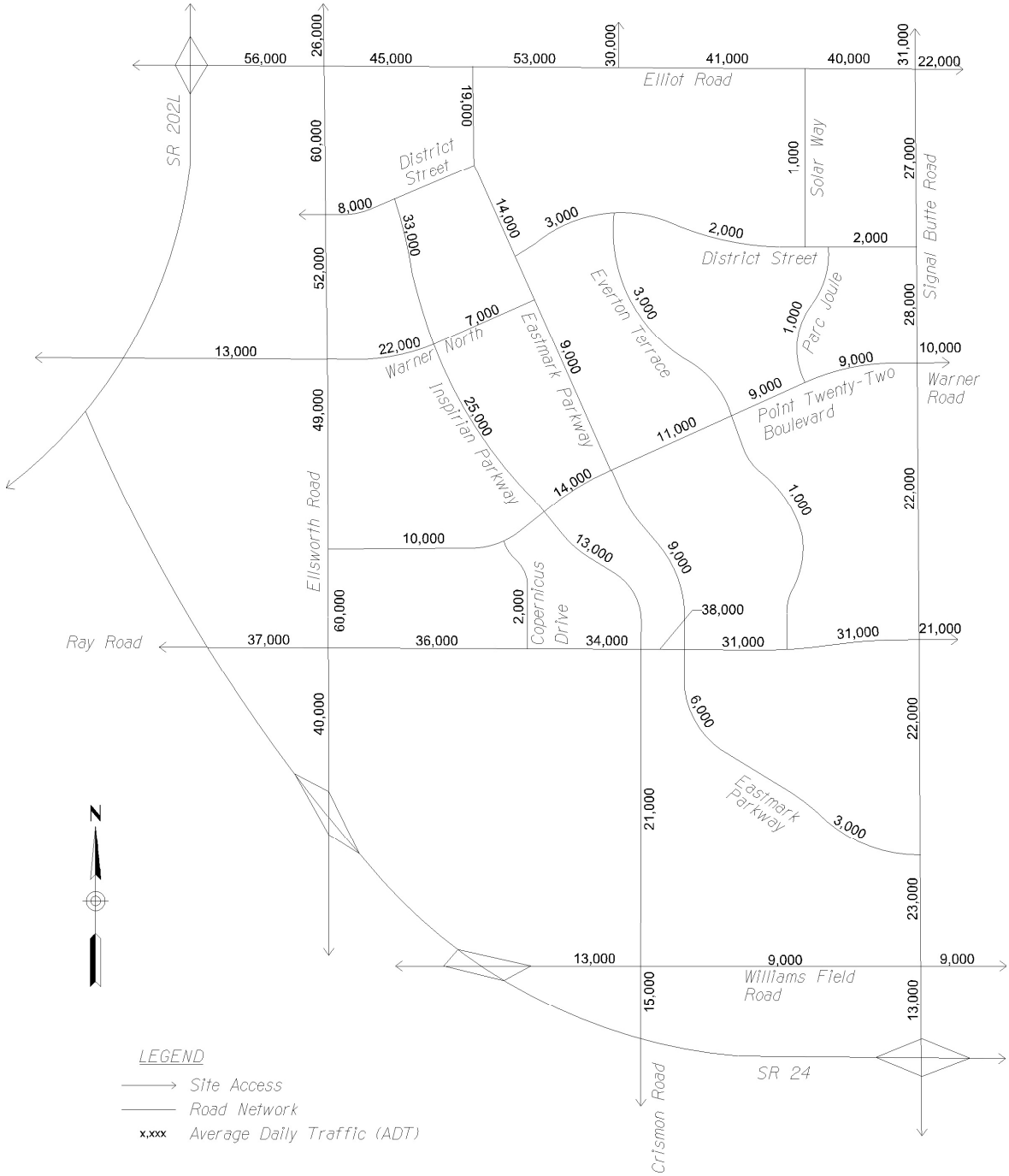

Figure 4.2 Year 2040 Total Traffic for Eastmark

5.0 ROADWAY IMPROVEMENT ANALYSIS

5.1 Capacity Analysis

The total build-out daily traffic volumes presented in **Figure 4.2** were analyzed for future roadway capacity needs on the internal and external roadways. In accordance with the original *Master Transportation Plan*, the MAG planning-level urban roadway level of service (LOS) capacities, as modified from the FDOT Q/LOS Handbook, were used as the capacity thresholds for the roadways in the study area. These threshold volumes are presented in **Table 5.1**. The roadway capacities reflect LOS E thresholds that are typically acceptable in developed urban areas.

Table 5.1 MAG Planning Level Urban Roadway Capacities

Roadway Classification	No. of Lanes	ADT	LOS
Minor Collector	2	16,000	E
Major Collector / Arterial	4	43,600	E
Principal Arterial	6	65,600	E

Based on the results of the anticipated total build-out traffic presented in **Figure 4.2** and the roadway capacity thresholds presented in **Table 5.1**, the roadway classifications and lane configurations recommended in the original *Master Transportation Plan* are still valid. Two-lane local internal roadways are anticipated to provide an internal grid network and connectivity throughout the site, and were modeled in the QRS II capacity model.

- Internal major collector four-lane roadways include: Eastmark Parkway (formerly “Spine East”), Inspirian Parkway (formerly “Spine West”), Warner Road (formerly “Warner North”), and Point Twenty-two Boulevard (formerly “Warner South”).
- District Streets, (formerly “Gaylord Drive” and “Mesquite Street”), Solar Way, Parc Joule, Everton Terrace, and Copernicus Drive are recommended as 2-lane roadways with left and right-turn lanes at major intersections. These streets may also be constructed as 4-lane roadways with the outside through lane used for right turning traffic.
- The adjacent arterial roadways, including Ray Road, Elliot Road, Ellsworth Road, Signal Butte Road, and Williams Field Road, will be six lanes.

5.2 Intersection Analysis

Peak hour intersection volumes were not developed as part of the *Master Transportation Plan*. This analysis is performed as part of the traffic study prepared for each DU. However, an assessment of potential traffic signal locations was conducted to confirm that the major roadways as currently proposed/planned will meet City of Mesa intersection spacing requirements. The anticipated and allowable signalized intersection locations are presented in **Figure 5.1**.

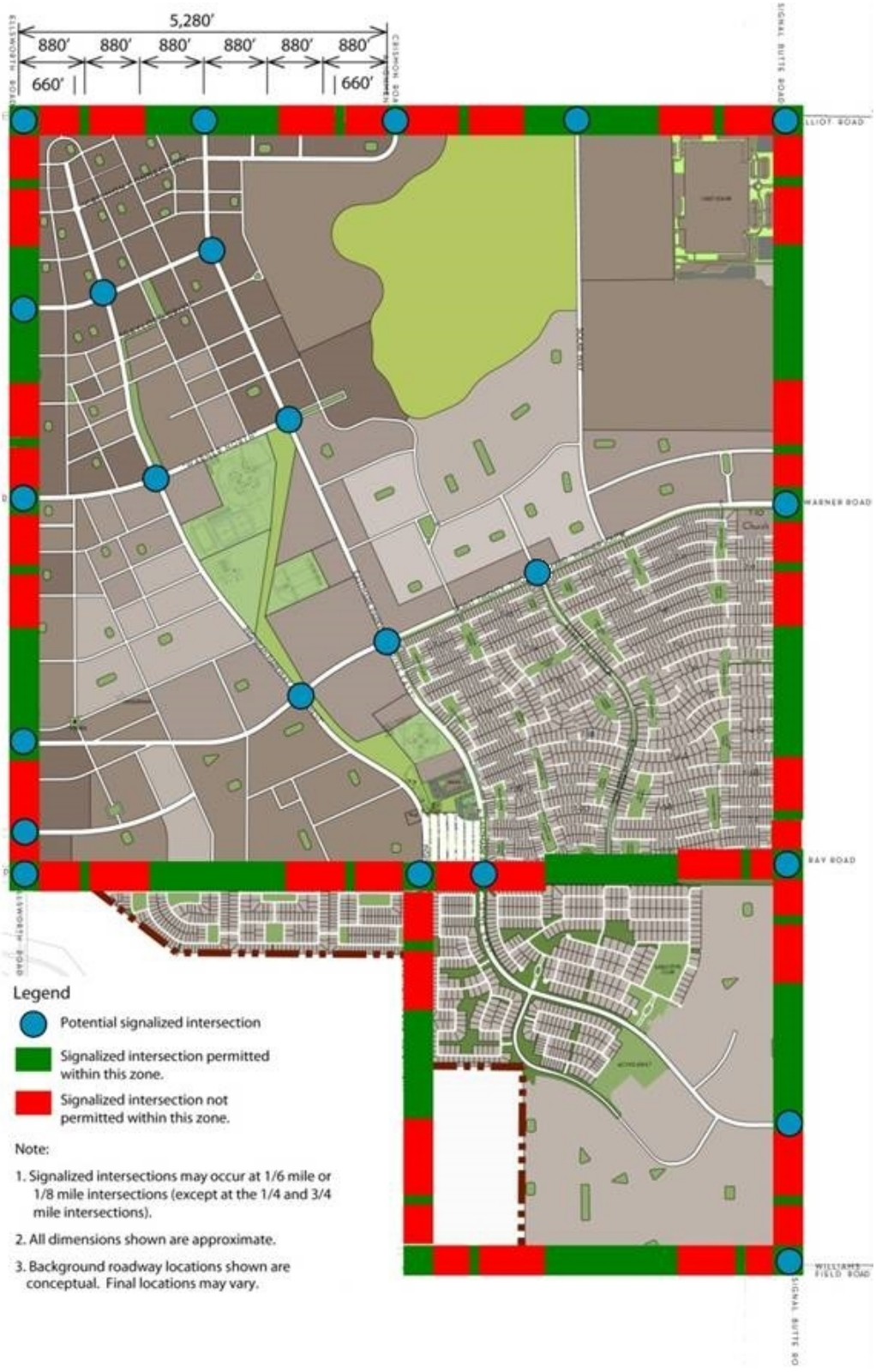

Figure 5.1 Potential Signalized Intersection Locations

6.0 CONCLUSIONS AND RECOMMENDATIONS

The *Master Transportation Plan* and its updates serve as a guide for transportation infrastructure to meet the multi-modal goals of Eastmark. The traffic analysis and resultant anticipated site trip generation for this update are based on the preliminary planning concepts for DU's 1, 2, 5, and 6. The proposed DUP's for DU's 3/4, 5e, 6n, 6s, 7, and 8/9 are reflected in this update along with the roadway networks and access points. Based on these assumptions, Eastmark at full build-out is anticipated to generate roughly 294,300 daily weekday trips. This is similar to the original *Master Transportation Plan*, which anticipated 300,000 weekday trips. Results of the analysis indicate that the roadway network as outlined in the Mesa General Plan will accommodate the traffic generated by Eastmark at full build-out.

6.1 Master Street Circulation Plan Recommendations

The recommendations of the initial *Master Transportation Plan* are still valid and are repeated herein:

> The following arterial-to-arterial intersections are anticipated to include two (2) left turn lanes, one (1) right turn, and three (3) through lanes for each approach:
>
> - Elliot Road and Ellsworth Road
> - Elliot Road and Signal Butte Road
> - Ellsworth Road and Ray Road
> - Signal Butte Road and Ray Road
> - Signal Butte Road and Williams Field Road

All intersections that connect a major arterial and a major collector from Eastmark are anticipated to include one (1) left turn lane, one (1) right turn, and three (3) through lanes for the major arterial approaches. The major collector approaches are anticipated to include one (1) left turn lane, one (1) right turn lane, and two (2) through lanes. These intersections include Ellsworth Road and Warner Road, Ellsworth Road and Point Twenty-Two Boulevard, Signal Butte Road and Point Twenty-Two Boulevard, Elliot Road and Eastmark Parkway, and Eastmark Parkway and Signal Butte Road.

The proposed roadway cross sections are presented in Section 10 "Street Standards" of the Community Plan. The design criteria and guidelines related to the design of the roadway facilities are also presented in Section 10 of the Community Plan. All local streets that are connecting to arterials are to be 34-foot wide cross sections.

6.2 Master Transit Plan Recommendations

As the Gateway Area develops, a regional transit system is anticipated to be implemented that serves the area, including bus rapid transit and local bus service. The regional and local transit corridors are anticipated to provide direct service to Eastmark and are proposed to be coordinated into the land use planning for the Site.

6.3 Master Bicycle and Urban Trails Plan Recommendations

Bicyclists will be accommodated on the arterials, collector/district streets and local/neighborhood streets. Urban trails/sidewalks will also be present on roadways and within the Eastmark Great Park. Design criteria and guidelines related to the design of bicycle facilities are presented in Section 10 of the Community Plan.